

REMARKS

Claims 1, 5-7 and 10 are pending in the application, Claim 11 has been deemed withdrawn by the Examiner. For reasons as set forth below, Applicants submit that reconsideration and allowance of the claims is appropriate.

35 U.S.C. §103 Claim Rejection

Claim 1, 5-7 and 10 are rejected under 35 U.S.C. 103(a) by the Examiner as being allegedly unpatentable over Kong et al. This rejection is respectfully traversed for the reasons as stated below.

According to the examiner "*Kong et al. clearly discloses a broad range of oligosaccharides with anti-tumor activity, which include straight chain oligosaccharides*".

However, the Examiner acknowledges that, among this broad range of oligosaccharides, Kong et al. "*does not explicitly disclose an unbranched saccharide having all the characteristics recited in the instant claims*".

In addition, the Examiner does not contest that Kong et al. only disclose the manufacture of a branched oligosaccharide (which has the formula given in page 5 of Kong et al.) and are silent concerning the synthesis of unbranched oligosaccharides according to the invention.

According to the Examiner, even if the synthesis of unbranched saccharides in Kong et al. is not disclosed, "*making unbranched homopolymers is much simpler to one skilled in the art*".

However, Kong et al. unambiguously mention that "*So far, no reports have been found on synthesis of oligosaccharide repeated unit of Lentinus edodes polysaccharide*" (p.5, last §). That clearly means that, at the date of filing of Kong et al, i.e. July 8, 2000, nobody knew how to synthesize the branched or unbranched oligosaccharides disclosed in Kong et al. For this reason, saying that "*making unbranched homopolymers is much simpler to one skilled in the art*" has no scientific basis and is a mere statement going against the teaching of Kong et al. In fact, Kong et al., faced to the problem of synthesizing branched and

unbranched oligosaccharides only succeeded in providing a partial solution to this problem, namely the synthesis of branched oligosaccharides.

The Examiner also mentions that *"even if it is assumed that one skilled in the art would not be able to synthesize a straight-chain tetrasaccharide or pentasaccharide without guidance, one skilled in the art would in fact be able to modify even the synthesis of the branched oligosaccharide to arrive at a straight chain oligosaccharide by leaving the 1,6-linked glucosyl side chain residues"*.

Again, this statement has no scientific basis and goes beyond the teaching of Kong et al.

Actually, the skilled person, having knowledge of Kong et al., would have only been able to synthesize a branched oligosaccharide. Indeed, the unbranched oligosaccharides used in the claimed invention are not obtained starting from branched oligosaccharide, as for instance those obtained following the method of Kong et al. As shown in examples 1 and 2 of the invention, the laminaritetraose and laminaripentaose according to the invention are obtained after a long and multi-step synthesis, which is totally different from the synthesis of the branched oligosaccharides disclosed by Kong et al.

In addition, even if it was assumed that the unbranched oligosaccharides according to the invention were obtainable starting from the branched oligosaccharides obtained by the method of Kong et al., since the step of "leaving off the 1,6-linked glucosyl side chain residues" is never disclosed nor suggested in Kong et al., the skilled person would never have been able to obtain the unbranched oligosaccharide used in the claimed invention.

Consequently, the Kong et al. reference is not considered enabled for the unbranched oligosaccharides.

It thus results that the teaching of Kong et al. cannot serve as basis for an obviousness rejection: the skilled person, having knowledge of Kong et al. and wanting to test the activity of unbranched oligosaccharides would never have succeeded since he would never have obtained these oligosaccharides...

The claimed invention is thus non obvious in view of Kong et al. for at least this reason.

Second, and as previously mentioned by the applicant, Kong et al. do not provide any experimental data supporting the alleged anti-tumor activity of unbranched oligosaccharides (see applicant's arguments presented in response to the office action dated April 15, 2009). The only suggestion of Kong et al. is that a branched oligosaccharide extracted from the fungus *Lentinus edodes* might have an anti-tumor activity. This teaching correlates with the results disclosed in the Ning et al. reference, previously cited by the Examiner.

In conclusion, the Kong et al. reference discloses:

- neither a method leading to the synthesis of laminaritetraose and laminaripentaose,
- nor an anti-tumor activity of laminaritetraose and laminaripentaose.

The sole teaching of Kong et al. is that a particular branched oligosaccharide may have anti-tumor activity (but no evidence is provided), which correlates with the teaching of the Ning et al. reference, already cited by the Examiner.

Accordingly, Kong et al. do not provide any supplementary information compared to Ning et al., and the skilled person, having knowledge of Kong et al. in view of Ning et al. would thus have considered that only the branched oligosaccharides might have anti-tumor activity.

Consequently, since neither the two particular oligo- β -(1,3)-glucans of the claimed invention nor their anti-tumor activity are disclosed, taught or suggested in Kong et al., claim 1 is non obvious.


Since claim 1 is non obvious, claims 5-7 and 10, which depend on claim 1, are also non obvious.

In view of the above arguments, it is considered that the claims are patentable over the cited Kong et al. reference, and that the application is now in proper form for allowance.

Consideration of these arguments and prompt allowance of the above claims are thus respectfully requested.

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